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Complex pellets of white-rot fungi for biotechnological applications

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Complex pellets (C.P.) of white-rot fungi Anthracophyllum discolor and Trametes versicolor were formulated with mycelium, activated carbon and sawdust (2:1:1) in Kirk medium for 15 days. The ligninolytic enzyme potential of C.P. was evaluated in solid medium (PDA/Poly R-478 and PDA/ABTS). Reactive orange 16 (RO16) and Basic violet 4 (BV4), were used as model molecules for decolourisation and ligninolytic activity, in modified Kirk medium with an 100 mgL^{-1} of dye, 100 rpm, 25 ºC for 15 days.

In solid medium complex A. discolor pellets have only showed peroxidase activity. In contrast, complex T. versicolor pellets have showed peroxidase and laccase activities. Decolourisation of RO16 by complex T. versicolor and A. discolor pellets was 97 and 100%, respectively. Furthermore, BV4 decolourisation by T. versicolor and A. discolor pellets was 77 and 76%, respectively. Complex T. versicolor pellets presented high manganese peroxidase and laccase activities with 163.2 and 84 UL^{-1} respectively. Complex A. discolor pellet presented high manganese-independent peroxidase with 78.92 UL^{-1} and less lignin peroxidase activity (5.7 UL^{-1}). In conclusion, the application of C.P. of white-rot fungal isolates from southern of Chile has potential for biotechnological applications such as the decolourisation of synthetic dyes in industrial effluent or in bioremediation processes.

Keywords: Complex pellets, ligninolytic enzymes, white-rot fungi, synthetic dyes